# TECHNICAL REVIEW DOCUMENT for OPERATING PERMIT 950PEP110

to be issued to:

Department of the Army **Fort Carson Army Base**El Paso County
Source ID 0410014

Michael E. Jensen June 26, 1998

### **TABLE OF CONTENTS**

Purpose	5
Source Description	6
Prevention of Significant Deterioration/New Source Review (PSD/NSR)	
Emission Sources	11
Combustion Sources - Engines	
Combustion Sources - Boilers	12
Fuel Dispensing Systems	
Open Burning and Open Detonation of Munitions/Ordnance/Related Materials	17
Smoke and Obscurant Use	18
Incinerator	19
Paint Booths	20
Hospital ETO Sterilizers and Industrial Wastewater Treatment Plant	21
Base-Wide Degreaser/Solvent Use	
Landfill Operations	
Soil Vapor Extraction System	24
Brown's Quarry	25
Abrasive Blast System	25
Alternate Operating Scenarios	26
Permit Shield	26
Hazardous Air Pollutants	27
Fugitive Particulate Emissions	27
Miscellaneous	27
Short Term Limits	28

## TECHNICAL REVIEW DOCUMENT for OPERATING PERMIT 950PEP110

to be issued to:

Department of the Army Fort Carson Army Base El Paso County Source ID 0410014

> Michael E. Jensen May 21, 1998

#### I. Purpose:

This document will establish the basis for decisions made regarding the applicable requirements, emissions factors, monitoring plan and compliance status of emission units covered by the operating permit proposed for this site. It is designed for reference during the review of the proposed permit by the EPA, the public, and other interested parties. The conclusions made in this report are based on information provided in the original application submittal of December 22, 1995; a final emissions inventory submittal of May 15, 1997; and numerous other submittals needed to provide the technical information necessary to prepare this Title V operating permit; a site visit on March 11, 1998; previous inspection reports as well as numerous telephone conversations with the permittee and the permittee's consultant (CH2MHill).

On April 16, 1998, the Colorado Air Quality Control Commission directed the Division to implement new procedures regarding the use of short term emission and production/throughput limits on Construction Permits. These procedures are being directly implemented in all Operating Permits that had not started their Public Comment period as of April 16, 1998. All short term emission and production/throughput limits that appeared in the Construction Permits associated with this facility that are not required by a specific State or Federal standard or by the above referenced Division procedures have been deleted and all annual emission and production/throughput limits converted to a rolling twelve (12) month total. Note that, if applicable, appropriate modeling to demonstrate compliance with the National Ambient Air Quality Standards was conducted as part of the Construction Permit processing procedures. If required by this permit, portable monitoring results and/or EPA reference test method results will be multiplied by 8760 hours for comparison to annual emission limits unless there is a specific condition in the permit restricting the hours of operation.

#### **II. Source Description:**

Fort Carson is located on the south side of the City of Colorado Springs, Colorado, in El Paso County. The installation stretches south along Interstate 25 into Pueblo and Fremont counties. The cantonment area of Fort Carson is located in the northern part of the installation.

Fort Carson houses the 3<sup>rd</sup> Armored Cavalry Regiment (ACR), 3rd Brigade, 4th Infantry Division (ID), 43 ASG, and 10<sup>th</sup> Special Forces (SF). As a result, the Base has several vehicle maintenance facilities for tanks and other tracked and wheeled vehicles. A complete tank engine depot maintenance and dynamometer testing facility is also located at Fort Carson. The Butts Army Air Field (AAF) is an active runway and hangar facility used primarily by Army rotary-wing aircraft.

Fort Carson military operations and tenant activities which have an impact on emissions include: the Army and Air Force Exchange (AAFES); Defense Reutilization and Marketing Office (DRMO); Pacific Architects and Engineers (PAE) (which provide operations and maintenance support to the installation); a medical detachment (MEDDAC); dental activity (DENTAC); the Colorado Air National Guard, Explosive Ordnance Detachment (EOD); Navy Construction Battalion (Seabees); Directorate of Logistics (DOL); Directorate of Public Works (DPW); Directorate of Planning, Training, and Management (DPTM) - Range Control; Directorate of Environmental Compliance and Management (DECAM); 759<sup>th</sup> Military Police (MP) Battalion; 52<sup>nd</sup> Engineering (EN) Battalion (BN); 4<sup>th</sup> ENGR and DIV ENGR.

The following generalized list of sources of air emissions exist at Fort Carson: boilers, heaters, space heaters, house-hold furnaces, emergency generators, hospital, industrial wastewater treatment plant, sewage treatment plant, landfill, pathological waste incinerator, paint spray booths, fuel storage and use operations, base-wide general solvent use, detonation and burning of ordnance, smoke and obscurants for training exercises, and several large engine test stands.

Fort Carson is located in a carbon monoxide (CO) non-attainment area. There are no affected states within 50 miles of the plant. There are no Federal Class I designated areas within 100 kilometers of the facility. Florissant Fossil Beds National Monument is a Federal land area within 100 kilometers of the facility. Florissant Fossil Beds has been designated by the State to have the same sulfur dioxide increment as a Federal Class I area.

The Title V application reports the Base operations are not subject to the requirements of Section 112(r)(7), the Accidental Release Plan program of the Clean Air Act. File information and the Title V application indicate the fuel burning equipment is not subject to the requirements of Title IV, the Acid Rain Program of the Federal Clean Air Act.

#### Prevention of Significant Deterioration/New Source Review (PSD/NSR)

During the review of the Title V application it was determined that Fort Carson had to be classified as a major source for Prevention of Significant Deterioration (PSD) or New Source Review (NSR), as the case may be. The PSD regulations first appeared in final form on December 5, 1974. Under the Clean Air Act Amendments of 1977, states were divided into geographic air quality management areas, and were required to determine whether or not ambient concentrations of each criteria pollutant met National Ambient Air Quality Standards (NAAQS). The areas that met the NAAQS were classified as attainment, and those that failed were classified as non-attainment. Colorado Springs was designated nonattainment for carbon monoxide under this program. A program known as Prevention of Significant Deterioration (PSD) was devised to maintain the attainment status of an area. A program known as New Source Review (NSR) was devised to direct efforts to move from non-attainment to attainment as existing sources might be modified, or new sources might be added, in the non-attainment areas. The PSD/NSR program used a preconstruction permitting process to accomplish the objectives. For emission sources located in attainment areas, PSD preconstruction review and permitting requirements apply to new major sources having a PTE of 250 tons per year (TPY) of any criteria pollutant, unless the source belongs to one of 28 specially listed major source categories. The threshold for defining a major source for the 28 categories is 100 TPY. A PSD preconstruction review may also be required as a result of a modification of an existing source. The modification review is triggered by an increase in emissions greater than a list of pollutant specific values.

When Colorado was officially granted approval for new source review is uncertain. There are various versions of the program dating to 1978. Colorado was granted PSD interim approval as of October 4, 1983. Full PSD authority was granted as of September 2, 1986.

In May of 1979 Construction Permits C-11,682-1 and C-11,682-2 were issued for two boilers. Each boiler had a design rating of 24.5 MMBtu per hour and was permitted to burn natural gas and fuel oils #2 through #6. Particulate and sulfur dioxide limits were set on the basis of pounds per million Btu of heat input. This resulted in a sulfur dioxide Potential-To-Emit (PTE) for each boiler of 171.1 tons per year, for a combined total of just over 342 tons per year. A source achieves PSD major source status whenever the PTE for any regulated pollutant exceeds 250 tons per year. This event, in and of itself, should have required a PSD review by EPA, but no review was made. The significance of this permit had been overlooked until the time of the Title V review. It is should also be noted that while the boiler PTE is high, the estimated actual emissions are quite low. At the time the permit was issued, or even at the time of subsequent permit issuances for other sources, it would have been an easy matter for the permittee to have accepted Federally enforceable limits for these two boilers that would have avoided the major source status. Even if very conservative

limits been initially established, it would have been possible in subsequent years for the these emissions and any new emissions to have been controlled at levels to avoid the major source status.

As noted above, a source achieves major source status for PSD when the PTE of any regulated criteria pollutant exceeds 250 tons per year. The PSD provisions identify 28 special categories that achieve major source status at a PTE of 100 tons per year instead of 250. Category 24 of the 28 special PSD/NSR categories is 'Fossil fuel boilers (or combinations thereof) totaling more than 250 million Btu per hour of heat input.' Fossil fuel is defined as natural gas, petroleum, coal, and any form of solid, liquid, or gaseous fuel derived from such material for the purpose of creating useful heat. During the Title V review it was realized that at some point in time the combined capacity of the numerous boilers installed at Fort Carson had exceeded the 250 MMBtu/hour Category 24 threshold. At that point in time the regulated pollutants achieved major source status at the 100 TPY level.

A thorough review of the available information was conducted and numerous meetings were held within the Division and with Fort Carson personnel to discuss the findings. The effort resulted in total frustration in trying to re-create the historic record of when sources were added, and trying to decide if a PSD review should have been done. An effort to try to determine when the Category 24 100 TPY threshold may have been established resulted in the same frustration. The source of the problems was the lack of available documentation to re-create the history of events. After much discussion and deliberation, the Division final reached the following decisions:

- 1. Fort Carson achieved the major source PSD category for sulfur dioxide emissions with the construction of the two boilers in 1979.
- 2. Fort Carson at some uncertain point in time achieved major source status for VOC emissions.
- 3. At an undefined point in time regulated criteria pollutants achieved major source status at 100 TPY because of PSD Category 24.
- 4. If the PSD major source status thresholds had been properly recognized, subsequent construction permits and permit modifications could have been developed to avoid the major source status.
- 5. Even if a historic point in time could be established when a particular source should have been subject to a PSD/NSR review, the performance of this review now would require spending a large amount of resources little or no air quality benefit.

- 6. The resolution of the issue was to document that Fort Carson is now to be a major source for PSD considerations. The documentation of the regulated criteria pollutants with major source status would be done by issuing construction permits for all existing sources, including grandfathered sources, with emissions above the construction permit thresholds. The construction permits limits established Federally enforceable limits that would establish the Fort Carson PTE levels. Fugitive emissions must be included in the PTE values.
- 7. The sum of the existing boiler heating input design was evaluated. If the value exceeded the PSD/NSR Category 24 250 MMBtu/Hr threshold, the PSD/NSR threshold will be 100 tons per year for each regulated criteria pollutant. Colorado Springs is a non-attainment area for carbon monoxide. A carbon monoxide PTE above 100 tons per year would require future source additions, changes or modifications to address carbon monoxide under the NSR provisions.

The submittals for the new construction permits also included requests to modify some of the existing construction permits. A tabulation of the Construction Permit limits established is included at the end of this document for review and reference as needed. The tabulated values are summarized in the following table.

		TONS PER YEAR						
	PM	PM10	$SO_2$	NOx	VOC	co		
Potential to Emit, Permitted Sources	101.72	88.86	50.40	241.92	330.48	59.29		
Potential to Emit, Insignificant Sources	4.86	4.86	0.90	46.62	2.67	9.90		
TOTAL POTENTIAL TO EMIT	106.58	93.72	51.30	288.54	333.16	69.19		
Actual Emissions, 1997	130.84	105.73	20.31	66.57	132.23	17.12		

The table above would seem to report the impossible situation of the estimated actual annual emissions being greater than the PTE. It must be kept in mind that some of the estimated actual emissions were based on operation at a maximum rate that was reduced when the construction permit limits were set or revised.

The construction permit emissions tabulation at the end of this document reports a total of 244.1 MMBtu/hr of boiler heat input under Federally enforceable limits, and an additional

288.6 MMBtu/hr from the insignificant fuel burning sources. There are sufficient boilers included in the insignificant sources to result in the total heat input rating exceeding the NSPS Category 24 cumulative threshold of 250 MMBtu per hour. The PTE threshold of Category 24 of 100 TPY must be used for determining when a pollutant reaches major source status. The total PTE values in the table above demonstrate Fort Carson has PSD major source status for particulate matter, nitrogen oxides and volatile organic compounds. Colorado Springs is non-attainment for carbon monoxide but Fort Carson has minor source status for carbon monoxide. Future new source emissions and permit modifications will have to be judged against the 100 ton threshold and the carbon monoxide non-attainment status.

The following Construction Permits had Initial Approval Status as the time of the issuance of this Operating Permit:

1 0		
94EP440	RCC	Paint Booth
96EP340-1	Bldg 9620	Burnham Boiler
96EP340-2	Bldg 403	Cleaver Brooks 17.7 MMBtu/Hr boiler
96EP340-6	Bldg 1515	Three (3) 10,000 gallon USTs for gasoline
96EP340-7	Bldg 900	Three (3) 10,000 gallon USTs for gasoline
96EP340-8		Fugitive emission leaks from gasoline dispensing
		equipment
96EP340-9	Bldg 8000	Four (4) engine testing dynamometers
96EP340-11		Base-wide solvent usage
96EP340-12		Range 1 opening burning of munitions
		Range 121 open detonation of munitions
96EP340-14		Training use of smoke and obscurants
96EP340-16	Bldg 8000	Small paint booth and large paint booth
96EP340-17	Bldg 2427	Two surface coating paint booths
96EP340-19	Bldg 900	Soil vapor extraction system
96EP340-20	Landfill #1	Landfill activities
96EP1320	Bldg 8004	Abrasive blasting booth

The due date of the first semi-annual monitoring report required by this operating permit will be more than 180 days after the initial approval construction permits were issued and the equipment commenced operation. The Division considers the Responsible Official certification submitted with the first semi-annual report will serve as the self-certification for the Construction Permits. The Division accepts the monitoring proposals provided in the Title V application as the submittal of the compliance plan that may be required by some of the Construction Permits.

Three (3) of Fort Carson's permitted emission sources are required to cease their activities when wind speed exceeds 20 miles per hour (mph). These sources are the landfill, smoke and obscurant related training activities, and open burning/detonation of ordnance type materials. The latter two

activities are unique to the mission of the Fort Carson. The smoke and obscurant training activities must be designed to deliberately exceed the 20% opacity standards in order to be effective. Fort Carson's experience has been that the wind speeds exceed 20 mph so frequently that available training time is too limited for the training mission. At the time the Operating Permit was prepared Fort Carson was petitioning the Air Quality Control Commission for relief from the 20% opacity requirement for the smoke and obscruant training. The landfill has ceased to accept municipal refuse and will be placing a final cover material on the site. Blowing dust may still be a problem until the vegetative cover is established.

Fort Carson submitted a written request for the wind speed restriction be raised from 20 mph to 30 mph for these three (3) sources. The primary reason for the wind speed restriction in the permits is to avoid off-property transport of fugitive particulate emissions (blowing dust).

#### **III. Emission Sources**

In the following discussion any reference to AP-42 is referring to the February 1996, issuance of the AP-42 guidance document.

Compliance Status - The compliance status for all the sources is summarized here to avoid repeating the statements under each source. At the time the Title V application was submitted there were a number of sources operating without the mandatory construction permits and that had not filed required APENs. As noted in the previous discussion, a PSD review may have been required for some of the sources. Fort Carson and the Division both agree that the Base was not in compliance with all the applicable requirements at the time the Title V application was submitted. Fort Carson certified that they were not in compliance in their Title V application.

#### **Combustion Sources - Engines**

1. Applicable Requirements - The Base has identified thirty (30) diesel engine driven generators for emergency electrical power. All but two of the generators are identified as insignificant sources based on horsepower and/or an annual operating time of less than 250 hours. These two generators associated with the Evans Community Hospital required construction permits. The emission factors are based on the number of operating hours for an engine. However, a fuel consumption standard was also set that requires the fuel usage to be monitored for compliance. Construction Permit 82EP044-3 was modified to establish the emission limits for these generators.

There are four dynamometers available for testing large engines. Dynamometer #1 was constructed in 1994 without an APCD Construction Permit. The unit has a 10 inch exhaust stack. The other three units, grandfathered from the regulatory requirement to have a Construction Permit, have 6-inch exhaust stacks. All the exhaust stacks are equipped with mufflers but no air pollution control

equipment. Dynamometers #1 and #4 are limited to engines up to approximately 900 horsepower, and dynamometers #2 and #3 are limited to engines up to approximately 400 horsepower. Construction 96EP340-9 was issued to establish the emission limits for the dynamometers.

**2. Emission Factors** - The emission factors used for the emergency generator diesel engines were obtained from AP-42 for diesel engines larger than 600 horsepower. The emission factors are based on the power output (lb/hp-hr) of the engine.

For the dynamometers the power output emission factors (lb/hp-hr) from AP-42, Section 3.3 for Diesel Industrial Engines (<600 HP) and Section 3.4 for Large Stationary Diesel Engines (>600 HP) were used since the 'brake-specific' method is the most accurate. The potential-to-emit for each dynamometer was based on 390 tests at a test duration of 6 hours. The engines are tested in accordance with a protocol specifying the length of time at each setting.

**3. Monitoring Plan** - The permit limits are established as 12 month rolling totals. This requires the emissions be calculated each month. Recordkeeping is required for the number of operating hours of each size of engine. The fuel consumption of the generator engines must also be monitored. The permittee will need to be mindful that a significant increase in the operating time for the diesel engine driven generators has the potential to exceed the permit limits.

#### **Combustion Sources - Boilers**

As might be expected for a facility of this size, there are a large number of boilers, heaters, furnaces, space heaters, indirect heaters and similar fuel burning equipment. The lack of proper recordkeeping had resulted in the following problems that needed correction:

A significant number of these units had construction permits but under the current regulations are categorically exempt from the need for a construction permit, and some were also exempt from APEN reporting.

Units were found to be operating without a construction permit.

Units had been removed from service but the records never corrected to show the inactivation.

There was a conflict between identification information stated in the permits and what actually existed on-site. For example, Construction Permits 82EP044-1 & 2 identified the boiler design ratings at 24 MMBtu/hr; however, they were installed with a 20 MMBtu/Hr.

1. Applicable Requirements - The following Construction Permits existed at the time the Title V application was submitted. Revised APENs were submitted to change the requested limits for some of the permits. These revisions were made directly in the operating permit. Some of these permits had just been issued as part of the resolution of the PSD review decisions. The applicable requirements from these new construction permits are incorporated in this operating permit as the compliance standards.

C-11,682-1 & 2	25 MMBtu/Hr (2 units)	NG, FO
12EP291-1 & 2	40 MMBtu/Hr (2 units)	NG, FO
12EP291-3	40 MMBtu/Hr	NG, FO, Used engine oil
82EP044-1 & 2	20 MMBtu/Hr (2 units)	NG, FO
86EP051-2	10.7 MMBtu/Hr	NG
96EP340-1	5.65 MMBtu/Hr	FO only
96EP340-2	17.7 MMBtu/Hr	NG only

With the exception of Construction Permit 96EP340-1, the fuel burning equipment is restricted to the use of pipeline quality natural gas for primary operation. No. 2 distillate may be used as a backup fuel during periods of curtailment in the supply of natural gas. The revision of 12EP291-3 included the removal of the use of used engine oil for fuel. The revisions C-11,682-1 & 2 included the removal of the use of fuel oil other than #2 distillate.

APEN 96EP340-4 was submitted for three 11.8 million Btu per hour natural gas fired boilers in Building 8000. Additional review determined that the individual boiler design capacities were 3.6, 3.6 and 2.6 million Btu per hour. Since each boiler has a design rating of less than 5 million Btu per hour, each boiler is eligible for the APEN exemption classification of Regulation No. 3, Part A, Section II.B.D.k.

The permittee requested clarification on the issue of the applicable requirements set forth in Regulation No. 1 Sections III.A.1.a and III.A.1.b and Regulation No. 6 Part B Sections II.C.1, II.C.2, and II.E. The Regulation No. 1 applicable requirements pertain to sources which have grandfather status for the regulatory requirement for obtaining a construction permit and APEN exempt sources. As a result of the resolution of the PSD issue previously discussed, all the fuel burning sources at Fort Carson were to have construction permits or be APEN exempt. An APEN exempt fuel burning source, while subject to these applicable requirements, could not violate these applicable requirements and remain APEN exempt. Construction permits set limits that are more stringent than these applicable requirements. It is not possible to violate these applicable requirements without first violating the construction permit limits. The Regulation No. 6 applicable requirements pertain to sources constructed, modified or placed in operation since the effective dates of the requirements. Some of the existing sources are subject to the Regulation No. 6 requirements as noted in the Operating Permit.

As noted at the start of this document the Division was directed to remove the short term limits previously established by existing Construction Permit. A listing of the short term limits not incorporated in this Operating Permit is provided at the end of this document. The removal of the short term limits made a number of the boilers subject to the Regulation No. 1 particulate and sulfur dioxide limits. Calculations demonstrate that the following boilers will always be in compliance with the Regulation No. 1 or Regulation No. 6 particulate and sulfur dioxide limits when operating on natural gas, or with the Regulation No. 1 particulate limit when operating on distillate fuel oil:

	PARTICULATE EMISSIONS						
Source	Size MMBtu/hr	Reg 1 Limit lb/MMBtu	Reg 6 Limit lb/MMBtu	PTE by Emission Factor, lb/MMBtu			
S049	5.65	0.32		0.014			
S008 S051	40 0.19			0.014			
S005	20		0.23	0.014			
S002	24.5		0.22	0.014			
S022	10.7	0.27		0.014			
S050	17.7	0.24	0.014				
		SULFUR DIOXIDE	EMISSIONS				
S008 S051	40	1.5		0.0006			
S005	20		0.8	0.0006			
S002	24.5		0.8	0.0006			

A similar type of compliance demonstration can not be made for the boilers in regards to the sulfur dioxide limits when operating on distillate fuel oil because the sulfur dioxide emissions are dependent on the sulfur content of the distillate fuel oil. Since the Division has no control over the fuel oil purchasing, the compliance demonstration must be performed based on the sulfur content of the distillate fuel oil currently being burned by a source. Fort Carson will need to be mindful that calculations do demonstrate that the NSPS sulfur dioxide limit will be exceeded for some of the boilers when the distillate fuel oil sulfur content equals or exceeds 0.8 percent.

**2. Emission Factors** - AP-42 provides emission factors for boilers with design ratings in the following ranges: <0.3-10 MMBtu/Hr, 10-100 MMBtu/Hr and > 100 MMBtu/Hr. All but one of the units fire natural gas as the primary fuel and use diesel fuel for a backup fuel supply. The sulfur content of the fuel oil was generally given < 0.5% in the Title V application. If an emission factor for sulfur dioxide is dependent on the fuel oil sulfur content, a value of 0.5% was used.

The natural gas emission factors have changed since the permit limits were set for the digester boiler. The original emission factors for the burning of the digester gas (methane) were determined by applying the ratio of the heat contents of the natural gas and methane (980/600 = 1.63) to the natural gas emission factors. Recent inspection reports note that most, if not all of the digester gas is flared. The digester gas was found to be too corrosive for use. The emissions for the digester flare are addressed elsewhere in this document.

**3. Monitoring Plan** - For fuel burning equipment of a given design rating, the emissions estimates are dependent on the amount of fuel used, and not the number of sources. At the time the Title V application was submitted, individual sources with significant fuel use were not separately metered. Fuel use for an individual unit was determined from the unit design rate and the number of operating hours. A project is currently underway to provide a computer system to monitor the natural gas use for individual buildings. A demonstration of the prototype system was provided during the site visit. The project is scheduled for completion by the fall of 1998. Until the individual metering project is complete, the current practice for estimating the fuel use will be continued for those units without meters.

Emissions from combusting fuel oil are estimated directly from the amount of fuel oil used. Monitoring the tank inventory allows a direct determination of the estimated emissions.

The Division has determined, based on AP-42 emission factors and engineering judgement, that particulate emissions from the fuel burning equipment will be insignificant when pipeline quality natural gas is used as fuel. Use of pipeline quality gas will be the compliance demonstration method for the opacity standard for natural gas combustion.

#### **Fuel Dispensing Systems**

1. Applicable Requirements - Colorado Springs is an attainment area for ozone and gasoline service stations are generally not issued construction permits. As part of the PSD review resolution, the two AAFES service stations were issued construction permits. A construction permit was also issued for the estimated fugitive emissions from leaks in the fuel dispensing equipment. The Building 8300 Mogas UST had been previously issued a construction permit.

```
96EP340-6 Bldg 1515 Three 10,000 gallon USTs
96EP340-7 Bldg 900 Three 10,000 gallon USTs
96EP340-8 Fugitive VOC emissions from fuel dispensing equipment leaks
```

**2. Emission Factors** - For the gasoline storage tank emissions estimations the breathing losses for the underground storage tanks (USTs) are considered to be zero since there are minimal temperature fluctuations of the stored fuel. The AP-42 gasoline VOC emission factors are 0.3 pounds per thousand gallons of throughput for working losses, and 11.7 pounds per thousand gallons of throughput for transfer and spillage losses, for a total of 12.0 pounds per thousand gallons of throughput.

The VOC emissions from leaks in the fuel dispensing system are estimated based on the number of components in the dispensing system, such as valves, flanges, pump seals, open-end lines, etc, and an emission factor developed from a statistical analysis of the potential for a leak from the component. The total emissions estimate will change when there is a change in the system piping. For each component an emission factor is provided in the EPA "Protocol for Equipment Leak Emissions Estimates", EPA-453/R-93-026, June 1993.

**3. Monitoring Plan** - A summary of the monthly fuel use and through-put is used for calculating the emissions from the storage tanks. The emission limits are for a 12 month rolling total which requires the compliance be determined each month.

#### Open Burning and Open Detonation of Munitions/Ordnance/Related Materials

These sources are somewhat unique to the military training mission of the Base. Open detonation is conducted at a specified location. A crater 8-10 feet deep by 15-20 feet in diameter is excavated and the explosive material is detonated in place. No soil covering or post detonation cleanup is conducted. The emissions are from the excavation process and the detonation. Open burning is also conducted at a specified location. Non-explosive types of materials, like propellants, are dumped from a vehicle into an irregularly-shaped, sand-bottom concrete containments approximately 10 foot by 10 foot. The emissions are associated with the burning of the material.

- 1. Applicable Requirements These two sources were grandfathered sources required to be permitted as part of the PSD review resolution. Construction Permit 96EP340-12 was issued for this source. The initial permit limited these activities to times when the wind speed was less than 20 miles per hour (mph). Ft Carson found the 20 mph wind speed severely restricted the training activities and requested the maximum wind speed be increased to 30 mph. While the higher wind speed would result in greater dispersion of the emissions, the physical size of the Army controlled area would avoid any off-property transport problems. The request for the higher wind speed was granted.
- **2. Emission Factors** The Resource Conservation Recovery Act (RCRA) Part B application was used by the permittee to determine the composition of the materials. The emission data provided in the document "Air Pathway Screening Assessments for RCRA Subpart X Permitting", U.S. Army Environmental Center, May, 1995, was used for the emission factor data. Short-term emission factors were used for worst case condition estimation. The detonation emission factors were calculated based on the pounds of Net Explosive Weight (NEW).
- **3. Monitoring Plan** The monitoring plan is for recordkeeping of the amount of materials processed for disposal. The plan calls for monthly determination of the compliance to ensure proper recordkeeping is maintained.

#### **Smoke and Obscurant Use**

This source is unique to the military training mission of the Base. This training is for the proper use and application of smoke and obscurants in military tactics. The training is conducted with the use of specially formulated smoke and fogging materials. It is immediately obvious the entire intent of this training is to generate as close to 100% opacity as possible.

1. Applicable Requirements - The 20% opacity standard can not be practically applied to this situation if the training is to be properly conducted. The Division did perform modeling analysis to identify the problems that might be created if the 20% opacity standard was not applied. One of the restrictions developed is that the training is limited to times when the wind speed is less than 20 miles per hour to limit the spread of the opacity outside the training area. Ft Carson found the 20 mph wind speed severely restricted the training activities and requested the maximum wind speed be increased to 30 mph. While the higher wind speed would result in greater dispersion of the emissions, the physical size of the Army controlled area would avoid any off-property transport problems. The request for the higher wind speed was granted.

During the mandatory 45 day review of the proposed permit by EPA, the Air Quality Control Commission approved a modification of the Regulation No. 1 opacity requirements. The modification was made to recognize the special military training requirements at Fort Carson. The modification becomes effective August 30, 1998. The change in the Title V permit to recognize the regulation modification requires an increase in the monitoring requirements. This type of change would be accomplished as an Administrative Amendment if the permit had already been issued. Since the permit was not yet issued, the change to incorporate the modification is being made prior to the issuing of the permit.

- **2. Emission Factors** The permittee used the Resource Conservation Recovery Act (RCRA) Part B application to determine the composition of the materials. The permittee used emission data provided in the document "Air Pathway Screening Assessments for RCRA Subpart X Permitting", U.S. Army Environmental Center, May, 1995. Short-term emission factors were used for worst case condition estimation.
- **3. Monitoring Plan** The monitoring plan is for recordkeeping of the amount of materials used for each month of training. The plan calls for monthly determination of the compliance to ensure proper recordkeeping is maintained.

#### **Incinerator**

1. Applicable Requirements - The Base has a classified documents incinerator and a pathological incinerator at the time the Title V application was submitted. The classified documents incinerator has been de-activated. Fort Carson requested the cancellation of Construction Permit 89EP005 I for the document incinerator. Construction Permit 86EP456 I established the compliance standards for the pathological incinerator based on Colorado Regulation No. 6, Part B, Section VII.

This unit does not have to comply with the requirements of biomedical waste incinerators (Colorado Regulation 6, Part B, Section V) because construction was begun prior to August 30, 1989 and because its capacity is less than 200 lbs/hr (Colorado Regulation No. 1, Section III.B.4).

These NSPS requirements (Colorado Regulation 6, Part B, Section VII) are State only requirements. However, the opacity and particulate requirements are both found in Colorado Regulation 1 (opacity - Section II.A.1 and particulate - Section III.B.4.b) which is part of the EPA approved SIP. Therefore, the NSPS requirements are both State and Federally enforceable.

**2. Emission Factors** - The gas use is measured by a meter and the waste material for incineration is weighed. Pathological incinerators are used for the destruction of pathological human and animal remains consisting of carcasses, organs, and solid organic wastes from hospitals, laboratories, abattoirs, animal pounds, and similar sources. This incinerator is located at the Vet Clinic in Building 6001, and typically operates three (3) hours per day, three (3) days per week, 52 weeks per year. The emission factors for the pathological waste incineration and natural gas combustion were taken from AP-42.

As noted above the classified document incinerator has been de-activated. The pathological incinerator remains inactive while the permittee is evaluating whether to make repairs and improvements, or to permanently close the unit. The need for repairs and the extended time since the last stack test justifies the need to perform a stack test if the incinerator is returned to service.

**3. Monitoring Plan** - The permit limits are established as 12 month rolling totals. This requires the emissions be calculated each month. Recordkeeping is required for the number of operating hours of each incinerator and the amount of material processed. The Construction Permit contained a perplexing requirement that the particulate emissions were not to exceed 0.10 grains per dry standard cubic foot corrected to 12% carbon dioxide. Compliance with this standard can only be demonstrated by a stack test. The monitoring plan established provides a combination of visible emission observations and Method 9 opacity observations to trigger the requirement to perform a stack test.

#### **Paint Booths**

1. Applicable Requirements - Construction permits existed or were issued as follows:

94EP061	One paint booth
96EP340-16	Two paint booths
96EP340-17	Two paint booths
94EP440	One paint booth

The construction permits do not limit the types of painting material used in the paint booths. This flexibility allow the operations to be conducted as necessary without the need to modify the permit. This flexibility is accommodated by the use of a closely monitored inventory of material usage to allow proper calculation of the emissions.

An Initial Approval Construction Permit had been prepared but not issued for the construction of a paint booth at the Range Control Complex (RCC). Construction acceptance difficulties resulted in a request for the permit to placed on inactive status. The permittee reports the completion of the construction is currently pending. The Final Approval for the Construction Permit had not been achieved at the time this operating permit was prepared. The due date of the first semi-annual monitoring report required by this operating permit will be more than 180 days after the initial approval construction permit was issued and/or the equipment commenced operation. Therefore, the Division considers the Responsible Official certification submitted with that report will serve as the self-certification for Construction Permit 94EP440 and the appropriate provisions of the Construction Permit have been directly incorporated into this operating permit.

**2. Emission Factors** - Estimating the emissions from the use of paints, solvents, thinners and similar items was somewhat difficult because there was not a good system for tracking the use of the materials. For example, the existing inventory system would identify procurement of the materials by purchase order, but would not include materials purchased with a credit card. Further, the system did not identify if the material procured was ever used. Finally, the hazardous materials processing system did not closely identify the source of the specific waste materials. The increased environmental monitoring requirements for these types of materials has resulted in the military development and implementation of new tracking systems that are expected to provide a significant improvement in the identification of the usage of materials of concern, or subject to regulations. These new monitoring/accounting systems are currently being implemented at the Base.

As would be expected for a facility of this size and type, there is usage of various amounts of paints, thinners, solvents, paint removers and so forth in the paint booths as well as Base wide. Emission factors for VOC and particulate matter vary widely with the material being used. Composition data such as Material Safety Data Sheets (MSDS) or other similar materials and the inventory of the

material usage will be used to provide the information necessary for an estimation of the VOC and non-criteria reportable materials emissions.

**3. Monitoring Plan** - Material usage will be reported on a monthly basis for entry into an emissions calculation system. Composition data such as Material Safety Data Sheets (MSDS) or other similar materials, purchase specifications, and other documents will be used for the identification of reportable components of the materials used that need to be entered into the system. Compliance determination on a monthly basis should allow sufficiently close tracking of the material usage. The particulate control filters are to be replaced/serviced in accordance with the manufacturer's recommendations. Paint penetration of the filters may be used as evidence of non-compliance with proper operation of the filters.

#### Hospital ETO Sterilizers and Industrial Wastewater Treatment Plant

APEN 96EP340-18 was submitted for the Evan's Community Hospital Ethylene Oxide (ETO) Sterilizers. APENS had not been submitted for these sterilizers when they were installed. The sterilizers are operated at a hospital. Therefore, Regulation No. 8 - Control of Hazardous Air Pollutants, Part E - Federal Maximum Achievable Control Technology, Section III - Federal Maximum Achievable Control Technology, Subsection D - National Emission Standards for Hazardous Air Pollutants for Ethylene Oxide Sterilization and Fumigation Operations (40 CFR Part 63, Subpart O) is **not applicable**. Based on the estimated actual annual uncontrolled emissions the Division issued a letter stating the sterilizers were required to submit APENs in accordance with regulatory requirements but a construction permit was not required. During the preparation of the Title V permit Fort Carson reported the ETO is no longer vented to the atmosphere, but rather is vented to wastewater lines routed to a wastewater treatment plant.

**1. Applicable Requirements** - APEN 96EP340-15 was submitted for the Industrial Wastewater Treatment Plant. The Industrial Wastewater Treatment Plant (IWWTP) is designed to process 0.5 million gallons of wastewater per day. As long as the wastewater flow treated does not exceed 179 million gallons per year the VOC emissions are below the current construction permit threshold. The Division's analysis did determined that APEN reportable amounts of 2, 4-Dinitrophenol (CAS 51-28-5) and Bis (2-ethylhexyl) phthalate (DHEP) (Dioctyl phthalate) (CAS 117-81-7) are emitted.

Based on the estimated actual annual uncontrolled emissions the Division issued a letter stating the IWWP is required to submit APENs in accordance with regulatory requirements but a construction permit is not required.

**2. Emission Factors** - There are three (3) sterilizers. Two small units exhaust their gas through a Donaldson catalytic abator which is expected to achieve 99.9% removal of the gas. The large sterilizer has no control system.

The IWWTP emissions were estimated from the information submitted by the permittee.

**3. Monitoring Plan** - The ETO and IWWTP emissions will be calculated each calendar year. Each year the estimated value must be checked against the previously reported APEN value to determine if a revised APEN is needed. The estimated emissions must also be checked against the Construction Permit threshold to determine if a construction permit is required.

#### Base-Wide Degreaser/Solvent Use

The primary solvent use is for degreasing/washing in parts cleaners and open basins. This type of work is done with commercial units using a closed loop system for the solvent. The solvent used is formulated to have a low VOC emission rate. Spent solvent is returned for re-processing. Fort Carson currently uses two types of solvents provided by Safety Kleen, and three products provided by Inland Technology (Skysol, Skysol 100 and Breakthrough).

**1. Applicable Requirements** - Colorado Springs is an attainment area for VOC. Degreasers in an attainment area are **not** subject to the requirements of Regulation No. 7 Section X. However, all volatile organic compound emissions sources are subject to the Regulation No. 7 Section V requirements for proper disposal of volatile organic compounds.

Base-wide solvent use was a grandfathered source issued Construction Permit 96EP340-11 as a result of the PSD review resolution.

- **2. Emission Factors** The majority of the solvents used on the Base consist of two products provided by Safety Kleen and three products provided by Inland Technology. The Division accepts the estimate that 5% of the solvent delivered to the Base is volatilized during use. Composition data such as Material Safety Data Sheets (MSDS) or other similar materials will be used to identify any non-criteria reportable pollutants in the solvent. If the Base desires to change the estimation method, the amount of solvent shipped off-site would need to be recorded to permit a mass balance calculation of the solvent lost.
- **3. Monitoring Plan** Vendor receipts, invoices, requisitions or records of inventory on hand orders will be used to identify the amount of the solvent delivered to the Base each month. The emissions will be estimated from the amounts recorded on the delivery records.

#### **Landfill Operations**

The 180 acre landfill site is approximately one (1) mile south of Harr Avenue and Titus Boulevard. Three separate operations are performed at the landfill site.

Sanitary Landfill - An April 29, 1998, letter notified the Division that municipal type waste is no longer delivered to the landfill. A contractor now handles the waste disposal off the reservation. The decomposition of the solid waste buried in the landfill will be a source of a decreasing amount of emissions for a considerable amount of future time. These emissions must be included in the air emissions inventory. A sector of the landfill is used for disposal of construction rubble which is not expected to have any emissions

Drying of Trap Solids - Solids captured in the wastewater traps at the vehicle washing and cleaning stations are spread on the ground to dry in one sector of the landfill. The soil must be dried before it can be incorporated into the landfill. The drying process results in the evaporation of any volatile organic compounds that may have been contained in the solids.

Soil Farming - The remediation of a number of leaking underground storage tanks sites resulted in a significant volume of contaminated soil that required treatment. The contaminated soil removed from the site is spread on the ground in one sector of the landfill. The soil is periodically manipulated to aid the drying and assist natural processes in breaking down the hydrocarbons in the soil. Contaminated soils from other activities at the Base are also processed in this activity.

It is noted that the term "contaminated" is not being used in an appropriate manner. "Contaminated" is normally used to designate the presence of undesirable organisms. "Polluted" is normally used to designate the presence of undesirable chemical or foreign objects. However, changing terminology at this point would lead to the potential for significant confusion.

**1. Applicable Requirements** - Construction Permit 88EP323-1 had previously been issued for the processing the contaminated soil delivered to the landfill site. Construction Permit 88EP323-2 had previously been issued for the drying of the vehicle cleaning solids (sludge). Construction Permit 96EP340-20 was issued for the landfill emissions as part of the PSD review resolution.

Regulation No. 7 Section V.A states no person shall dispose of volatile organic compounds by evaporation or spillage unless RACT is utilized. The Division considers the soil farming is a treatment process for soil delivered to the site and not a process for disposal of volatile organic compounds. Regulation No. 7 Section V.A is listed as an applicable requirement to prevent volatile organic compound materials being brought to the site and mixed directly with other landfill materials. Compliance with this requirement would be demonstrated by restricting the delivery of the contaminated soil to only the active soil farming site.

#### 2. Emission Factors -

Landfilling - The emissions from the decomposition of the solid waste are commonly estimated from a software program developed by EPA. The Division accepts the use of this software for this determination.

Contaminated Soil Farming - Samples of the contaminated soil delivered will be analyzed for the VOC content. The assumption is made that all the entire VOC content of the contaminated soil will be released to the atmosphere before the soil is incorporated in the landfill.

Sludge Drying - Samples of the solids from the vehicle cleaning traps will be tested for VOC content. However, there is no limitation on the VOC emissions from the drying of this material.

#### 3. Monitoring Plan -

Landfilling - Although municipal waste is now no longer incorporated in the landfill the decomposition emissions will continue at a decreasing rate for some time into the future. The EPA landfill will be used to estimate the emissions. The initial permit limited these activities to times when the wind speed was less than 20 miles per hour (mph). Ft Carson found the 20 mph wind speed severely restricted the operation and requested the maximum wind speed be increased to 30 mph. While the higher wind speed would result in greater dispersion of the emissions, the physical size of the Army controlled area would avoid any off-property transport problems. The request for the higher wind speed was granted.

Contaminated Soil Farming - Samples of the soil delivered to the site will be analyzed for the VOC content. The amount of the material delivered each month will be measured and recorded. The two pieces of information allow the estimation of the monthly emissions.

Sludge Drying - The amount of material delivered each month will be measured and recorded. The VOC content of the material delivered will be determined by a Division approved sampling plan.

#### **Soil Vapor Extraction System**

A soil vapor extraction system is used to extract soil gas from the unsaturated soil zone of six (6) extraction wells. The off-gas is sent through two (2) vapor phase carbon extraction vessels in series prior to discharge to the atmosphere. The system is designed for an air flow rate of 300 cfm.

**1. Applicable Requirements** - The applicable requirements were established by Construction Permit 96EP340-19.

- **2. Emission Factors** The emissions estimates are to be based on the carbon filter exhaust gas flow rate and the test analyses of the exhaust gas.
- **3. Monitoring Plan** The carbon filter exhaust flow rate and a sample of the exhaust gas are to be collected and analyzed at least once every six (6) calendar months.

Brown's	Ouarry	
DIOMII 2	Quarry	

This source is currently in not in active operation. The source is included in the Title V permit to make provision for future use as needed. The terms and conditions of the Operating Permit shall apply at anytime the source is placed in operation. APENS must be filed as appropriate to reflect the level of on-going operation.

- **1. Applicable Requirements** Construction Permit 95EP420 had been previously issued for this source. The permit is for the quarry mining related activities (extraction, handling, stockpiling and hauling of the material) only. Any process equipment (i.e. crushers, screens, etc.) to be located at the site must be addressed by separate limitations or requirements. The permit sets an annual production limit for the amount of surface-quarried granitic rock.
- **2. Emission Factors** The emissions are from the extraction, handling, stockpiling and hauling of the material. The emissions were estimated by use of AP-42 emission factors. All the emissions are considered to be fugitive dust.
- **3. Monitoring Plan** The permit sets forth a fugitive dust control plan that is to be followed for controlling the emissions.

APEN 92EP1370 had previously been submitted for this system. The Division made a written determination that the source was exempt for APEN reporting as long as the annual consumption of abrasive blasting media did not exceed 6,500 pound per year. During the preparation of the draft of this operating permit, a new APEN was submitted for a requested level of use of 48,000 pounds of abrasive blast media per year. The media used would be garnet, soft plastic or aggressive plastic. Rather than issue a separate construction permit, the requirements for Construction Permit 92EP1370 were incorporated directly into the operating permit.

- **1. Applicable Requirements** The applicable requirements were established directly in this operating permit.
- **2. Emission Factors** The Division accepts the conservative assumption that all the media will be expended and escape to the atmosphere during use.
- **3. Monitoring Plan** An inventory of the type and amount of the media used each month will be maintained. Provision is made in the permit requirements to allow the amount of emissions estimated to be reduced for the amount of media that might be removed for waste disposal. This provision requires proper recording keeping of the type, amount, and the disposal method and location for the waste media.
- **4. Compliance** Since the proper documents were submitted in a timely manner the Division accepts that this source was in compliance at the time the Title V application was submitted.

Alternate Operating Scenarios	

No alternate operating scenarios were identified

### Permit Shield

The intent of the permit shield is to provide limited protection to the Base in the event of an error in the evaluation of whether a regulation, or portion of a regulation applies. The Base identifies the issue and presents its position. The Division reviews the position. If the Division and the facility mutually agree on the position, the issue is recorded in the operating permit. If there is a disagreement on the position, the Division has reserved the right to make the final decision. If, at a later date, it is discovered that an error was made in the mutual decision, the Base is protected from the non-compliance due to the error. However, the Base must move rapidly to obtain compliance.

In the Title V application the applicable sections of the Federal and State regulations are identified for the sources. The shield request was granted and noted in the Operating Permit where a specific request for the shield was identified, justified and accepted by the Division. The shield was not granted where a blanket request lacked specific detail, the request was not justified, or the Division did not agree that shield protection could be applied.

#### **Hazardous Air Pollutants**

The hazardous air pollutants for the Base originate as a component of the fuels used and from the various materials used in painting and degreasing. These emissions were discussed above under the operational sources section.

#### **Fugitive Particulate Emissions**

The provisions of Regulation No. 1 §III.D require existing sources to employ control measures to minimize fugitive particulate emissions. In general, the 20% opacity and no off-property transport are guidelines, not enforceable applicable requirements. Enforcement action against existing fugitive particulate sources can be taken only if a permittee continues to operate after failure to comply with the provisions of the control plan identified in the construction permit.

The modernization and upgrading of the Fort Carson facilities requires a number of land development permits. These permits normally have an expiration date set at the expected date of construction completion. The issuances and expiration of these permits are an on-going process and as such can not be efficiently incorporated into this operating permit.

Inspection reports note training exercises have caused fugitive dust problems on the Base. Wind conditions and direction can result in the fugitive dust impacting on the community. The permittee will have to be diligent in controlling fugitive dust emissions on the Base. As part of this diligence, Fort Carson has an inventory of magnesium chloride for use in dust control activities. The chemical can be used to supplement watering for dust control during training exercises or land development operations as necessary.

#### Miscellaneous

From time to time published emission factors are changed based on new or improved data. A logical concern is what happens if the use of the new emission factor in a calculation results in a source being out of compliance with a permit limit. For this operating permit, the emission factors or emission factor equations included in the permit are considered to be fixed until changed by the permit. Obviously, factors dependent on the fuel sulfur content or heat content can not be fixed and will vary with the test results. The formula for determining the emission factors is, however, fixed.

It is the responsibility of the permittee to be aware of changes in the factors which may affect the compliance status. Upon notification, the Division will work with the permittee to address the situation.

During the preparation and review of the Title V materials it was noted that there were a number of construction permits for Fort Carson for Pueblo and Fremont counties. These construction permits were researched and determined to be no longer necessary or the responsibility of another entity. Some of the construction permits no longer necessary were canceled.

When the Title V application was submitted the photography shop was identified as an insignificant source. At the time of the preparation of the Title V permit Fort Carson reported that the shop uses only digital equipment or sends the film to an outside contractor. This source was removed from the insignificant source list based on this updated information.

#### **Short Term Limits**

As noted at the start of this review document, new procedures resulted in the removal of short term emission and production/throughput limits from Construction Permits. The table below documents existing short term Construction Permit limits that were not incorporated in the Operating Permit.

Construction Permit	Emission Point	NOx, lb/hr	CO, lb/hr	VOC, lb/hr	SO <sub>2</sub> , lb/hr	PM lb/hr	PM <sub>10</sub> lb/hr	Fuel Use or Process Rate
96EP340-1	S049 - 5.65 MMBtu/Hr Boiler	0.9			3.0			41 gph
12EP291-3	S008 - 40 MMBtu/Hr Boiler	5.71	1.43		20.63	0.57	0.57	286.5 gph & 40,817 scf/h
12EP291-1&2	S051 - 40 MMBtu/Hr Boilers (2 Each)	5.71	1.43		20.63	0.57	0.57	286.5 gph & 40,817 scf/h
82EP044-1&2	S005 - 20 MMBtu/Hr Boilers (2 Each)	2.80	0.71		10.32			
C-11,682-1&2	S002 - 24.5 MMBtu/Hr Boilers (2 Each)	3.43	0.86					
85EP051-2	S022 - 10.7 MMBtu/Hr Boiler	1.50						

96EP340-2	S050 - 17.7 MMBtu/Hr Boiler	2.48	0.62					17,706 scf/hr
82EP044-3	S053 - 810 KW Generators (2 Each)	50.0	11.4		8.8	0.9	0.9	
96EP340-9	S057 - Dynamometers (4 Each)	43.9	9.6	2.2	5.7	3.7	3.7	20,000 hp- hr/d
96EP340-6	S054 - 10,000 gallon UST (3 each)			174 ppd				14,000 gpd
96EP340-7	S055 - 10,000 gallon UST (3 each)			156 ppd				12,000 gpd
96EP340-8	S056 - Fugitive VOC emissions			32.7 ppd				
96EP340-11	S059 - Base-wide Solvent Use			88 ppd				
88EP323-1	S029 - Soil Farming			100.0 ppd				92.6 cy/d & 125.0 tpd
95EP420	S048 - Brown Quarry							680 tpd
95OPEP110	S067 - Abrasive Blast System							2.0 ton/month
94EP061	S038 - Paint Booth			21.5		0.2	0.2	
95OPEP110	S071 - WWTP Digester Flare							18,904 scf/d